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Eaton - A System for the Improvement of Common Schools. 1829.

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SYSTEM OF EDUCATION

PROPOSED

FOR THE IMPROVEMENT

OF

COMMON SCHOOLS.

ADDRESSED TO

THE BUFFALO SCHOOL ASSOCIATION.

BEING

AN ANSWER TO A CIRCULAR,

ISSUED DECEMBER 26, 1828.

BY AMOS EATON, A. M.

SENIOR PROFESSOR OF THE RENSSELAER-SCHOOL.

ALBANY:
PRINTED BY WEBSTERS AND SKINNERS,
At their Bookstore, in the White House, corner of State and Pearl Streets.
1829.

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GRADUATE SCHOOL OF EDUCATION
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To Josiah Trowbridge,
Heman B. Potter,
Ebenezer Johnson,
Dyre Tillinghast,
Lewis F. Allen.
A Committee, appointed by the Directors of the Buffalo School Association.

Having been frequently requested by respectable patrons and teachers of Common Schools, to exhibit, in a pamphlet form, those views of education which have been deduced from a long course of experience, I avail myself of your circular as a convenient occasion for the following brief remarks.

It is pretty extensively known, that the Hon. Stephen Van Rensselaer, of Albany, set up a school in Troy, N. Y. for the purpose of having trials made, with a view to ascertain, as far as possible, what improvements could be made in the general plan of education. He had previously employed two agents,* with four assistants,† to make trials of the same nature, at his expense, by a kind of itinerating course, in the western part of the state. He has since established this school and continued it between four and five years. He has expended many thousands with a view to accomplish that object; not for the purpose of favoring this particular location. For he proposes making an application to the Legislature for annexing the school to the Institute at Albany, as soon as the object, for which he established it, is accomplished.‡

Last summer he offered an experimental term of fifteen weeks to one person from each county in the state, on condition that he should return to the same county and lend his aid towards improving the plan of education. This proposal was made with a view to bring into the field a body of zealous young men, who would act in concert in the great cause. Several counties availed themselves of the proposition; and some of the young gentlemen have been successful in their efforts. But some did not feel full confidence in their qualifications for conducting an experimental course.

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* Prof. L. C. Beck and myself.

† Messrs. J. Smith, Geo. White, T. D. Eaton and H. H. Eaton.

‡ A plan has not yet been matured for effecting this object. As three departments are now united by law, under the general head, called *The Albany Institute*, to wit: 1, the Department of Physical Science and the Arts; 2, the Natural History Department; 3, the General History and Literary Department; perhaps the Rensselaer School may be united to the Institute under the head of Education Department. There might be numerous acting branches in various parts of the state, the professors of which might constitute a legal board, meeting annually at the Institute.

Mr. V. R. has now offered to add the experimental part of two terms for the farther improvement of those who attended last season; also to admit to the same privileges another young gentleman from each county, to be appointed by the county clerks. Notices of such appointments have already been received from several counties; and it is presumed that every county clerk, who is desirous to improve the state of learning, will endeavour to search out and select a suitable candidate before the fifteenth of April—the time for commencing the course. It is therefore to be hoped, that a sufficient number of experimental teachers will be furnished to the counties to assist school associations in their laudable efforts.

With this introduction, I shall attempt to answer your five very comprehensive queries. But it will not comport with the plan I had proposed to myself, to follow them in their order. I will therefore insert them, with a very short answer to each; to be followed with my general views on the subject of education, without again referring to your queries.

1. Question. "What is your opinion of the Monitorial System of education, generally?"

Answer. Excellent, under judicious regulations—pitiful mummery on the usual clamorous application of it. Children thereby acquire loose, careless, vulgar habits, which require to be unlearned at the expense of much time and severe discipline.

2. Q. "If approved, to what age and to what branches would you extend that system of instruction?"

A. It is most profitably applied among students of mature years, while engaged in studying the experimental sciences. I would never select a monitor under twelve or thirteen years of age, and he should always act under the immediate eye of a superintendent.

3. Q. "What, in your opinion, is the best present, practical system of education, beginning with the rudiments, and extending through a classical and scientific course?"

A. Begin with a system which requires the exercise of the senses and memory, now in all their strength; and which does not require much from the judgment, now feeble and immature. Natural and artificial bodies, with their appropriate names, should occupy the young mind. Such as plants, minerals, maps, &c. The English language should be learned by reading plain familiar works, containing matters which require the exercise of the memory and which will be useful later in life. Such as interesting selections from history, important epochs in chronology, &c. The memory should never be burdened with fictions, as novels and romances. The learned languages may be studied by the aid of literal translations ; whereby the idioms will become familiar and the meaning of words deeply fixed in the memory. But the grammar of any language should not be studied at this early age.

As the faculty of judgment approaches maturity, grammar, rhetoric, logic, mathematics, the natural sciences, &c. may be introduced in turn. Always illustrate every department by experiments and specimens ; whereby the fancy and imagination will be enlisted in aid of the memory. But there is a limit in this mode of instruction, beyond which the exhibitions themselves become worse than useless. For example : a student will understand the celestial machinery by referring to a few plain things, as a hoop, an apple, &c. in a fourth part of the time which it will require to understand the mere machinery of an orrery or planitarium, set before him for its illustration. Pestalozzi's model plan is useful to a certain limit. But it becomes a ridiculous farce, as extended by some teachers, professing to adopt his method.

The numerous extravagant plans proposed or attempted in this country would seem to imply, that all the old institutions of learning were so many nuisances or sinks of ignorance. I would adopt the modern improvements in science, and give them a practical direction to the concerns of life. I would also introduce those facilities in aid of classic studies, which experience has justified. But I give as an answer to your third question, that most of those new institutions which have attracted so much notice, have in my opinion, *no plan* but that of increasing their number of pupils and accumulating wealth. They are therefore harmless, excepting so far as they discourage the zealous patron of improvement, who is disappointed in finding the morals of his son degenerated and his mind not improved.

4. Q. " What is your opinion of a weekly course of scientific " lectures, generally, to the whole school, accompanied with illus- " trations by proper apparatus ?"

A. A course of general lectures to the whole school, both scientific and literary, would be of inestimable value. But the lectures should be given daily, or at least four or five in each week.

5. Q. "What is your opinion of educating the two sexes in "the same institution, but in separate apartments and under separate instructors—admitting them equally, under the care and inspection of their several instructors, to the weekly scientific "lectures?"

A. Should always be educated together. The usual separation arose in the Monkish policy of the dark ages, and has been continued, with some other absurdities of our colleges and boarding schools. Young ladies are always either under the care of their parents or guardians at home, or are placed under the care of the mistress of a family in whom the parents have full confidence. And I can conceive of no greater exposure of female delicacy at a school, than at church. A change in this particular would greatly improve the state of society. It would tend to excite emulation, to soften the manners of both sexes, and to change that kind of attachment which savors rather of appetite than esteem, into rational and durable friendship.

SYSTEM OF EDUCATION, IN ACCORDANCE WITH THE PRECEDING ANSWERS.

Extensive innovations should not be attempted. I would propose no change at present for winter schools. Experimental and demonstrative science, should be introduced, with their application to the concerns of life. But while fostering these, literature should not be neglected.

I would establish an Experimental School at some central or convenient place, for the accommodation of several other schools. Beginning with populous villages and towns, I would there demonstrate the utility of the plan; then extend it to places whose population is less dense, until every individual in the state should feel its influence.

The schools to be benefitted by the experimental school, whether district schools, select schools, or whatever they might be named, should constitute a circuit. The number of circuit schools may be from three to ten or twelve. In these schools, I would propose no change; excepting that during the summer season, while the experimental school is in operation, they should commence earlier in the morning, and close at four o'clock in the afternoon; so as to be ready to enter the experimental school at half past four. The teachers of circuit schools would naturally accommodate their daily exercises to the course of the experimental school, when it should appear to be advisable.

I would limit the exercises of the experimental school to the summer season, both on account of the length of the days and to save the expense of fuel. The first term should commence on the twelfth of April, and end the fourth of July. The second term should commence on the twenty-sixth of July and end on the eighteenth of October. During this period, the full light of each day would always be continued, in this latitude, more than fourteen hours. Therefore commencing at half past four, P. M. two and a half hours at the experimental school might be employed daily, and in some part of the season it might be conveniently extended to three hours. But two hours would generally be a sufficient length of time for the whole exercises.

As I propose to leave the circuit schools to their own usual course, I shall confine my observations to the experimental school.

BUILDINGS.

It will be more convenient to my purpose, to commence with a description of the buildings. In describing these I wish to be understood, that other forms of buildings may be used. Old buildings may be fitted up, which were originally constructed upon very different plans. But by explaining what I deem the best plan, my opinion would be better understood in relation to fitting up old buildings. The principal objects to be kept in view are:

1. To have the upper ceiling of the laboratory high, for the ascent of suffocating gases; to have the laboratory on the lower floor for the convenience of carrying in and throwing out water; and to have the place of the furnaces and forges secured against endangering the buildings.

2. To have the natural philosophy room about thirty-six feet long and at the south part of the building, for the convenience of using a megascope, solar microscope, and other optical instruments.

I should recommend the erection of buildings of the following dimensions for an experimental school, conducted by one professor and two assistants, where the circuit consists of about six schools, averaging thirty pupils to each.

One building to be called the PHILOSOPHY HOUSE, two story high; another building, to be called the CHEMICAL HOUSE, one story high.

Let each building be fifty-four feet long, extending north and south, and twenty feet wide. The lower room of the philosophy house ten, and the upper 9, feet between the floor and upper ceiling. The walls of the chemistry house thirteen feet high, and the upper ceiling arched, so that the highest part of the arch shall be fifteen feet above the floor.

Cut the chemistry house into two laboratories—the south one thirty-six feet, leaving the other eighteen feet. Make a chimney in the partition with a large fire-place and oven-like forge in each room, back to back. Make a broad hearth extending six feet into each room. In these fire-places and forges, the air-furnaces, bellows, lead-pots, &c. are always to be used.

Both rooms are to be ventilated by an opening around the chimney with an outer case, or wall, of brick, arising at the top of the arch and extending as high as the chimney; so as to leave an open space six inches thick between the brick walls.

The large laboratory is to be occupied as a lecture room for chemistry, mineralogy and geology, when lectures are given to the whole school by the professor, or the assistant professors. The small laboratory is to be occupied by forenoon students as a lecture room, under the direction of the assistants.

Cut the lower story of the philosophy house into three rooms, for the afternoon exercises of students of the circuit schools. Let these rooms be numbered from the south end, No. 1, No. 2, No. 3. The numbers 1 and 3, to be twenty feet each, leaving number two but fourteen feet. Cut the upper story into two rooms, leaving the south room thirty-six feet long, the north room, of course, eighteen feet long. The south room is to be occupied as a lecture room for experimental philosophy, mathematics, philosophy of the mind, moral philosophy, rhetoric, logic, geography, history, national economy, botany and zoology, when lectures are given to the whole school by the professor or the assistant professors. The north room is to be occupied by forenoon students, as a lecture room, under the direction of the assistants.

FURNITURE OF THE ROOMS.

Lower story of the Philosophy House.

No. 1. **The Cabinet.** Collections of minerals, plants, shells, insects, fish, &c. Also, historical specimens, maps, charts, globes, &c.

No. 2. **The Survey-Room.** Compass, chain, quadrants, levels, cases of small instruments, guaging rods, board measures, &c.

No. 3. **The Assay-Room.** Forge, furnace, bellows, argand's lamp, anvil, vice, hammer, crucibles, ladles, assay glasses, test glasses, florence flasks, scales, suit of tests and reagents, iron and wedgewood mortars, &c. This room should be furnished with numerous varieties of soils, ores, mineral waters, &c. for exercising students in the various manipulations of chemical analysis.

Upper story of the Philosophy House.

These rooms should both be furnished with simple apparatus, sufficient for illustrating the principles of natural philosophy. As plain, coarse wooden apparatus for the mechanical powers, a megascope and other simple optical instruments, an air pump, hydraulic instruments, simple electrical and magnetic apparatus, &c.

Chemical House.

Both rooms should be furnished with the simple chemical apparatus, now coming into general use, throughout this state. Lists of the articles may be found in the common Text Book, prepared for Rensselaerean Schools, third edition.

EXERCISES AT THE EXPERIMENTAL SCHOOL.

FORENOON EXERCISES. All forenoon students should devote their whole time to the experimental and demonstrative course. No one should be admitted to this course until his mind is well disciplined to habits of study. If he has not received the degree of bachelor of arts, he ought to pass an examination in the elementary principles of natural philosophy, chemistry, the practical problems in geometry, geography, history, rhetoric and logic. If he has made considerable proficiency in Latin and Greek, he will be prepared to make much better progress for such acquirements. Some of these branches of learning may be dispensed with however, if the student possesses genius and is very persevering.

Forenoon students ought to pay for reagents and tests, fuel for the furnaces, argand's lamp, &c. which will amount to about $10 per term. They should be exercised by giving extemporaneous lectures, illustrated by their own experiments, or by demonstrative exhibitions, under the guidance of an assistant professor. The subject should always be the same with that of the professor's lecture on the preceding afternoon.

As the forenoon exercises are to be conducted upon the Rensselaerean plan, and as this plan is before the public, I shall not give any further account of it.

AFTERNOON EXERCISES. The afternoon should be occupied in preparing for the professor's lecture, and in teaching the students of the circuit schools.

At 4 o'clock, P. M. all the circuit schools should be dismissed. At precisely half past four, the professor should commence his lecture before all the circuit students, the forenoon students, and those gentlemen and ladies who attend no exercises but the professor's lectures. He should limit his lecture to precisely one hour, excepting in cases where the nature of the experiments requires a little extension of the time.

After the professor's lecture, the circuit students should be directed to rooms, according to a previous arrangement of them. The circuit teachers, male and female, should aid the assistant professors, according to the arrangement of the professor.

Circuit students should be distributed into three divisions.

No. 1, to include those who are engaged in the circuit schools, in reading, writing, common arithmetic, Botany, Latin, Greek, French, &c.

No. 2, to include those, who are studying geometry, mechanical philosophy, including astronomy, engineering, &c.

No. 3, to include those who are studying chemistry, mineralogy, zoology, rhetoric, logic, philosophy of the mind, &c.

Students of No. 1, to enter the room No. 1, and there be arranged in sections, and be taught, by labels and the *dictum* of teachers, subjects of the botanical, mineralogical, and zoological sciences. Also to be instructed demonstratively in the works of art, in geography, history, &c. by charts, maps, globes, &c.

By pursuing this course diligently, even young children will store up a valuable stock of names and facts, to be of vast importance when the judgment becomes sufficiently matured for making applications to the concerns of life, or for using them as subjects of scientific arrangement. These students should be encouraged to collect, preserve, and label, plants, minerals, &c. for future reviews.

Students of No. 2, to enter the room No. 2, and be distributed as in No. 1. Some divisions to be led into the field, and there exercised in land surveying and engineering ; others should remain at the room to plot, calculate, &c. surveys previously taken ; others should be employed in taking the latitude, longitude, moon's parallax, &c.

Students of No. 3, to enter the room No. 3, and be distributed as in No 1. As there will generally be the smallest number in this division, the whole should work by turns, at the analysis of soils, minerals, mineral waters, animal and vegetable matter, &c.

FEMALE STUDENTS.

Those who belong to the circuit schools should all attend in the cabinet, No. 1. They should, however, have one part of the room allotted to them, and be distributed into sections. I can see no objection to this, which would not apply with equal force to attending church. But those who are under the influence of such scruples can construct a separate cabinet.

Females will not wish to attend the hardy exercises of the survey-room or of the assay-room. But all will, of course, attend the professor's lectures. And ladies of mature years, who are desirous to obtain an experimental knowledge of the natural sciences, or who may be designed for teachers, may be admitted to the exercises of the forenoon course. They may read lectures, sitting, while their female companions perform the experiments as assistants. A respectable lady, of a suitable age, should preside at these exercises, assisted by an assistant gentleman, who should aid in the manipulations. Probably some ladies would prefer attending to those exercises at a different time in the day from that assigned to gentlemen. In this they might be indulged, without deranging the daily course.

EXPENSES.

Those school associations, which abound in funds, may expend thousands very pleasantly in purchasing splendid apparatus. But it will be more useful to community to instruct the rising generation with apparatus whose cost will be within the means of every village or town. Principles of science and their application to agriculture, the arts, domestic economy, and all other concerns of life, are best taught by simple means.

Three hundred dollars will be sufficient to purchase chemical and philosophical apparatus, with which every known principle appertaining to those sciences can be illustrated. A little may be added yearly; but I would prefer encreasing the library, to adding much to such an apparatus.

The cabinet may be supplied by the contributions of students, exchanges, private donations, &c. with all the most important specimens. A very small well selected cabinet will enable the professor to give an instructive course.*

A permanent fund for the support of one professor, is all that is necessary, after the buildings are erected and furnished. For one, two, or three, assistants may always be obtained for no other compensation than board and tuition, on account of the great value of such an opportunity to review the course.

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* The Troy Lyceum obtained an excellent mineralogical and geological collection by sending out an experienced agent, on a tour of four weeks. He was furnished with a strong carriage and team, one assistant, and some local minerals for exchanging. The whole cost amounted to but three hundred dollars.

The success of this plan, like that of all others, depends much on the skill, good sense, and prudence, of its earliest patrons and agents. A failure for want of talents in the teachers would be ascribed to the inefficacy of the system, at the outset of its application. But after the utility of the system has been proved, future failures will be ascribed to the true cause. In your hands, gentlemen, I most ardently hope, that the experimental system of education will receive an impulse which may long be felt, and widely diffused. Learning will then be directed to its proper object—the amelioration of the condition of man.

Most respectfully,
Your humble servant,
AMOS EATON.

Rensselaer School, Troy, April 3, 1829.

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RENSSELAER SCHOOL EXTE

After a successful trial of the *Experimental* and *Dissertation* method of teaching, justly called the *Re*
gentlemen over 17 years, called *Circle Students*, for the last five years; the Trustees have directed me, as sc
er students, denominated *Preparation Students.* Accordingly a separate suit of rooms will be assigned to
students to pursue their course as usual. This arrangement will be put in practice on the 3d Wednesd
weeks—Spring term, from 1st Wednesday in March, 15 weeks—Fall term, from 3d Wednesday in July, 15

A carriage, upon the plan of New-York accommodation carriages, (but longer, lower, better enclose
accidents,) will daily fetch and return every pupil who resides in any part of Troy, without additional charg
Kill. The carriage will pass down one principal street and return by another, morning and evening, at a
the pupils wherever parents or guardians direct. By this arrangement children will have the benefit of c
exposure or an opportunity to be truant.

Students will be charged for the time of attendance only—reckoning from the time of entrance to tl
winter term of 12 weeks, $8, for the two summer terms of 15 weeks, $10 each: excepting for experime
which will be $15, after deducting the $9 heretofore allowed for chemical tests, reagents, fuel and light-
own, together with the small apparatus.

All students taught on the school premises will be called into a common lecture room every day, to
lecture, free of additional charges. This course of lectures will compass the circle of learning taught
to the youthful mind.

BRANCHES TAUGHT.

1. Geography. *Physical*, traced from the geological structure of the earth. *Civil*, traced historical
2. Mathematics. Practically applied to Land-surveying, Harbor-surveying, Engineering, Traverse
   Planets, Latitude and Longitude, Guaging casks and water-craft, Timber measure, &c.
3. Experimental Chemistry and Natural Philosophy.
4. Natural History, including Mineralogy, Geology, Botany and Zoology.
5. Extemporaneous Speaking and Composition, with the application of Rhetoric and Logic.
6. Applications of the Sciences to Agriculture and the Arts.

Rensselaer School, Troy, Sept. 23, 1829.

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Assistants are

Accommodation Departments.

To accommodate families who prefer having several children at the same school, a building in a s
assigned to that object. One room will be the reading-hall for female pupils—another will be us
another will be the Pestellozzi-room for young children, where all the valuable part of Pestellozzi
be *under the direction* of an experienced Female teacher, aided by assistants proportioned in num

As a farther accommodation, a room in the principal building will be assigned to students
to translate, and *Book-keeping.*

own responsibility. Fee